

Claims

1. A smart card reader comprising:

5 a card reader part for receiving a smart card detachably connectable to it and for communicating information between the smart card reader and the smart card, and

10 a short-range communications part coupled to said card reader part for communicating information using a RF wireless method between the smart card reader and a wireless communications terminal external to it, said short-range communications part comprising a processing unit for controlling the short-range communications part, wherein

(i) said processing unit comprised in the short-range communications part is configured to control, in addition to the operation of the short-range communications part, also the operation of the card reader part,

(ii) the smart card reader is configured to communicate with the wireless communications terminal and the smart card by using a set of protocol layers comprising at least an application layer and a transmission layer, and wherein

20 (iii) said short-range communications part is configured to receive an application layer level command from the wireless communications terminal and

(iv) said processing unit is configured to convert the application layer level command into a transmission layer level command for a transfer to be performed to the smart card, and to transfer said converted transmission layer command via the card reader part to the smart card.

2. A smart card reader according to claim 1, wherein the processing unit is arranged to convert the application layer level command into the transmission layer level command and transmit the command to the smart card in whole.

3. A smart card reader according to claim 1, wherein the processing unit is

arranged to convert the application layer level command into the transmission layer level command and transmit the command to the smart card in parts.

- 5 4. A smart card reader according to claim 1, wherein the smart card reader is fitted to receive an APDU (Application Protocol Data Unit) from the wireless communications terminal over a short-range RF connection and to transmit the APDU to the smart card in one or more TPDU (Transmission Protocol Data Unit).
- 10 5. A smart card reader according to claim 1, wherein the smart card reader is adapted to receive a higher application level command from the wireless communications terminal, to generate an Application Protocol Data Unit based on the command, and to transmit the Application Level Data Unit to the smart card with the aid of a transmission protocol in transmission protocol data unit(s).
- 15 6. A smart card reader according to claim 1, wherein the short-range communications part is implemented by means of a Bluetooth module and where the short-range communications part is arranged to control the operations of the card reader part by executing card reader software stored in the Bluetooth module.
- 20 7. A smart card reader according to claim 1, wherein the processing unit comprised by the short-range communications part comprises one of the following: microprocessor, microcontroller, digital signal processor.
- 25 8. A smart card reader (31) according to claim 1, wherein said short-range communications part comprises one of the following: Bluetooth transceiver, WLAN transceiver (Wireless Local Area Network).
- 30 9. A smart card reader (31) according to claim 1, wherein said smart card is one of the following: electronic purse card, electronic payment card, electronic

identification card.

10. A smart card reader comprising:

5 a card reader part for receiving a smart card detachably connectable to it and for communicating information between the smart card reader and the smart card, and

10 a short-range communications part coupled to said card reader part for communicating information using a RF wireless method between the smart card reader and a wireless communications terminal external to it, said short-range communications part comprising a processing unit for controlling the short-range communications part, wherein

15 said processing unit comprised in the short-range communications part is arranged to control, in addition to the operation of the short-range communications part, also the operation of the card reader part.

11. A smart card reader according to claim 10, wherein the smart card reader is adapted to receive a Transmission Protocol Data Unit from the wireless communications terminal over a short-range wireless RF connection and to pass the Transmission Protocol Data Unit to the smart card.

12. A smart card reader comprising:

a card reader part for receiving a smart card detachably connectable to it and for communicating information between the smart card reader and the smart card, and

25 a short-range communications part coupled to said card reader part for communicating information using a RF wireless method between the smart card reader and a wireless communications terminal external to it, said short-range communications part comprising:

30 a RF integrated circuit for transmitting and receiving a RF signal, and a baseband integrated circuit coupled to the RF integrated circuit for processing baseband signals, said baseband integrated circuit comprising a processing unit arranged to control the operations of the RF integrated circuit in addition to processing baseband signals, thus essentially controlling the

operation of the whole short-range communications part, wherein

said processing unit comprised in the baseband integrated circuit is arranged to control, in addition to the operation of the short-range communications part, also the operation of the card reader part.

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13. A system comprising a wireless communications terminal and a smart card reader, said wireless communications terminal comprising a short-range transceiver and said smart card reader comprising:

10 a card reader part for receiving a smart card detachably connectable to it and for communicating information between the smart card reader and the smart card, and

15 a short-range communications part coupled to said card reader part for communicating information using a RF wireless method between the smart card reader and a short-range transceiver of the wireless communications terminal, said short-range communications part of the smart card reader comprising a processing unit for controlling the short-range communications part, wherein

20 said processing unit comprised in the short-range communications part of the smart card reader is arranged to control, in addition to the operation of the short-range communications part, also the operation of the card reader part of the smart card reader.

14. A method for communicating information in a system comprising a wireless communications terminal and a smart card reader located externally to it, connected via a short-range wireless RF connection, said smart card reader being adapted to receive a smart card detachably connectable to it, said method comprising:

25 the wireless communications terminal, smart card reader, and smart card implementing a set of protocol layers comprising at least an application layer and a transmission layer;

30 communicating between the wireless communications terminal, the smart card reader, and the smart card according to said protocol layers in such a way that the method comprises:

generating an application layer level command in the wireless communications terminal;

transmitting the application layer level command from the wireless communications terminal to the smart card reader over a short-range wireless connection,

receiving the application layer level command at the smart card reader,

converting, in the smart card reader, the application layer level
command into a transmission layer level command for a transfer to be
10 performed to the smart card,

transferring said converted transmission layer level command from the smart card reader to the smart card.

15. A method according to claim 14, the method further comprising:

15 receiving the transmission layer level command at the smart card,

converting the transmission layer level command into an application layer level command in the smart card; and

executing said command.